

CLAIMS:

1. An energy harvesting circuit comprising
an inherently tuned antenna, and
at least portions of said inherently tuned antenna structured to employ inherent distributed induction and inherent distributed capacitance to form a tank circuit to provide regenerative feedback into said antenna, whereby said inherently tuned antenna will have an effective area substantially greater than its physical area.
2. The energy harvesting circuit of claim 1, including
said circuit being structured to produce said regenerative feedback through at least one of the group consisting of
 - (a) a mismatch in impedance,
 - (b) a showing of power generated by said inherently tuned antenna,
 - (c) inductance, and
 - (d) reflections due to said mismatch of impedance.
3. The energy harvesting circuit of claim 2, including
said circuit does not require discrete capacitors.
4. The energy harvesting circuit of claim 1, including
said antenna is an electrically conductive coil having predetermined width, height and conductivity.
5. The energy harvesting circuit of claim 4, including
a material of predetermined permittivity disposed adjacent to said conductive coil.
6. The energy harvesting circuit of claim 1, including

said circuit is structured to provide said regenerative feedback through a mismatch in impedance.

7. The energy harvesting circuit of claim 1, including
said circuit is structured to provide said regenerative feedback through sharing of power generated by said inherently tuned antenna.

8. The energy harvesting circuit of claim 1, including
said circuit is structured to provide said regenerative feedback through inductance.

9. The energy harvesting circuit of claim 1, including
said circuit is a stand-alone circuit.

10. The energy harvesting circuit of claim 1, including
said circuit is formed on an integrated circuit electronic chip.

11. The energy harvesting circuit of claim 1, including
said inherently tuned antenna having an effective area greater than said antenna's physical area by about 1000 to 2000.

12. The energy harvesting circuit of claim 1, including
said tank circuit structured to regenerate said inherently tuned antenna.

13. The energy harvesting circuit of claim 4, including
said conductive coil being a planar antenna, a substrate in which said conductive coil is constructed on one surface and a ground plane on an opposite surface, and
said antenna having inherent distributed inductance and inherent distributed capacitance forming a tank circuit and inherent distributed resistance structured to regenerate said antenna.

14. The energy harvesting circuit of claim 13, including
said circuit is structured to provide at least a substantial portion of said inherent distributed capacitance between said conductive coil and said ground plane.
15. The energy harvesting circuit of claim 13, including
said circuit is structured to provide at least a substantial portion of said inherent distributed capacitance between segments of said conductive coil.
16. The energy harvesting circuit of claim 13, including
said circuit is structured to provide a portion of said inherent distributed capacitance between said conductive coil and said ground substrate, and
a portion of said inherent distributed capacitance between segments of said conductive coil.
17. The energy harvesting circuit of claim 1, including
said circuit being structured to receive RF energy.
18. The energy harvesting circuit of claim 1, including
said circuit having inherent distributed resistance which contributes to said feedback.
19. The energy harvesting circuit of claim 6, including
said circuit is structured to provide feedback due to standard wave reflection due to said mismatch in impedance.
20. An energy harvesting circuit comprising
a plurality of inherently tuned antennas with each said antenna having portions structured to provide regenerative feedback into the said antenna, each said inherently tuned antenna having a said circuit that employs inherent distributed inductance and inherent

distributed capacitance to form a tank circuit, whereby said inherently tuned antennas will each have an effective area substantially greater than their respective physical areas.

21. The energy harvesting circuit of claim 20, including
said circuit being structured to produce said regenerative feedback through at least one of the group consisting of

- (a) a mismatch in impedance,
- (b) a sharing of power generated by said inherently tuned antenna,
- (c) inductance, and
- (d) reflections due to said mismatch of impedance.

22. The energy harvesting circuit of claim 21, including
each said inherently tuned antenna having a circuit not requiring discrete capacitors.

23. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having an electrically conductive coil having predetermined width, height and conductivity.

24. The energy harvesting circuit of claim 23, including
each said inherently tuned antenna having a material of predetermined permittivity disposed adjacent to said conductive coil.

25. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having a circuit that is structured to provide said regenerative feedback through a mismatch in impedance.

26. The energy harvesting circuit of claim 20, including

each said inherently tuned antenna having a circuit that is structured to provide said regenerative feedback through sharing of power generated by said inherently tuned antenna.

27. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having a circuit that is structured to provide said regenerative feedback through inductance.

28. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having a circuit that is a stand-alone circuit.

29. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having a circuit that is formed on an integrated circuit electronic chip.

30. The energy harvesting circuit of claim 20, including
each said inherently tuned antenna having an inherently tuned antenna having an effective area greater than said antenna's physical area by about 1000 to 2000.

31. The energy harvesting circuit of claim 21, including
each said inherently tuned antenna having a tank circuit and an inherent resistance structured to regenerate said inherently tuned antenna.

32. The energy harvesting circuit of claim 23, including
each said inherently tuned antenna having a conductive coil being a planar antenna, a substrate in which said conductive coil is constructed on one surface and a ground plane on an opposite surface, and
said antenna having inherent distributed inductance and inherent distributed capacitance forming a tank circuit and inherent resistance structured to regenerate said antenna.

33. The energy harvesting circuit of claim 32, including

each said inherently tuned antenna having a circuit that is structured to provide at least a substantial portion of said inherent distributed capacitance between said conductive coil and said ground plane.

34. The energy harvesting circuit of claim 32, including
each said inherently tuned antenna having a circuit that is structured to provide at least a substantial portion of said inherent distributed capacitance between segments of said conductive coil.

35. The energy harvesting circuit of claim 32, including
each said inherently tuned antenna having a circuit that is structured to provide a portion of said inherent distributed capacitance between said conductive coil and said ground substrate, and

a portion of said inherent distributed capacitance between segments of said conductive coil.

36. The energy harvesting circuit of claim 20, including
said circuit being structured to receive RF energy.

37. The energy harvesting circuit of claim 20, including
said circuit having inherent distributed resistance which contributes to said feedback.

38. The energy harvesting circuit of claim 25, including
said circuit is structured to provide feedback due to standing wave reflection due to said mismatch in impedance.

39. The energy harvesting circuit of claim 18, including
said circuit structure to employ parasitic capacitances.

40. A method of energy harvesting comprising
- providing an inherently tuned antenna, and
- providing at least portions of said antenna structured to provide regenerative feedback into said antenna such that said inherently tuned antenna will have an effective area substantially greater than its physical area,
- employing in said circuit inherent distributed inductance and inherent distributed capacitance to form a tank circuit.
- delivering energy to said inherently tuned antenna through space, and
- providing a portion of the energy output of said inherently tuned antenna as regenerative feedback to said inherently tuned antenna to thereby establish in said antenna said effective area substantially greater than said physical area.
41. The method of energy recovery of claim 40, including
- said circuit being structured to produce said regenerative feedback through at least one of the group consisting of
- (a) a mismatch in impedance,
 - (b) a sharing of power generated by said inherently tuned antenna,
 - (c) inductance, and
 - (d) reflections due to said mismatch of impedance.
42. The method of energy recovery of claim 41, including
- employing a said circuit which does not require discrete capacitance.
43. The method of energy recovery of claim 40, including
- employing in said antenna an electrically conductive coil having predetermined width, height and conductivity.

44. The method of energy recovery of claim 43, including
employing a material of predetermined permittivity disposed adjacent to said
conductive coil.
45. The method of energy recovery of claim 40, including
employing a mismatch in impedance in said circuit to effect said regenerative
feedback.
46. The method of energy recovery of claim 40, including
employing a sharing of power generated by said inherently tuned antenna to effect
said regenerative feedback.
47. The method of energy recovery of claim 40, including
employing inductance in said circuit to effect said regenerative feedback.
48. The method of energy recovery of claim 40, including
employing a stand-alone circuit as said circuit.
49. The method of energy recovery of claim 40, including
employing a circuit formed on an integrated circuit electronic chip as said circuit.
50. The method of energy recovery of claim 40, including
creating said circuit with an effective antenna area about 1000 to 2000 times the
physical area of said antenna.
51. The method of energy recovery of claim 41, including
employing said tank circuit and said inherent resistance to regenerate said
antenna.
52. The method of energy recovery of claim 43, including
employing as said conductive coil a planar antenna,

employing a substrate having said conductive coil on a first surface and a ground plane on an opposite surface, and

employing as said antenna a circuit having inherent distributed inductance and inherently distributed capacitance forming a tank circuit and inherent distributed resistance to regenerate said antenna.

53. The method of energy recovery of claim 52, including
employing at least a substantial portion of said inherent distributed capacitance between said conductive coil and said ground substrate.

54. The method of energy recovery of claim 52, including
employing at least a substantial portion of said inherent distributed capacitance between segments of said conductive coil.

55. The method of energy recovery of claim 52, including
employing a portion of said inherent distributed capacitance between said conductive coil and said ground substrate and a portion of said inherent distributed capacitance between segments of said conductive coil.

56. The method of energy recovery of claim 40, including
said circuit having inherent distributed resistance which contributes to said feedback.

57. The method of energy recovery of claim 45, including
said circuit is structured to provide feedback due to standing wave reflection due to said mismatch in impedance.